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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,901	01/14/2002	Adam Divelbiss	VRex-0035USAAON00	1384
26665	7590	09/24/2004	EXAMINER	
REVEO, INC. 85 EXECUTIVE BOULEVARD ELMSFORD, NY 10523			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 09/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/045,901

Applicant(s)

DIVELBISS ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Remark*

- This Office Action is in response to applicant's amendment filed on June 21, 2004, which has been entered into file.
- By this amendment, the applicant has canceled claims 1-21 and has newly added claims 22-33.

The applicant is respectfully noted that however the *claim status indicator* for claim 30 is incorrectly stated as “canceled”, correction is respectfully requested.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 22-33 are rejected under 35 U.S.C. 112, first paragraph**, as based on a disclosure which is not enabling. **Synchronization** between the supplying of the left eye and right perspective image signals and the switching of the digital micro-mirror display is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The specification and the claims do not give the support for simply having “the switcher being *independent* of the rate at which image data is received” will result 3D stereoscopic image projection. The specification teaches *specifically* that an **Output Synchronization method**, which means synchronization between the *processed* 3D image data and the switching of the DMD display **must be** provided in order to have the switching rate independent of the rate of *input* data signal being received, (please see paragraph [0143]).

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 22-33 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 is indefinite and incomplete since the claim fails to give a structural and logical relationship between the “left eye perspective image and right eye perspective image” and the “image data recited by the stereoscopic projection system”. It is not clear if they are the same images or not. If not how do the “image data received” *become* the “left eye perspective and right eye perspective image”. The specification gives disclosure of the image data received and then *being processed or formatted* to become 3D image data, namely the left eye perspective image and right eye perspective image arranged in a fashion for projection. If this is the difference between the two, such step of image processing must be stated explicitly in the claims.

The phrase “3D stereoscopic projection system” is wrong and confusing. The term “3D” means three-dimensional, the term “stereoscopic” also means “three dimensional”. This phrase should either be “3D *image* projection system” or “stereoscopic *image* projection system”. Also it is the *image* being projected.

The phrase of “independent of *any* clock signal internal to said 3D stereoscopic projection” recited in claim 23 and the phrase “independent of *any* index signal internal to said 3D stereoscopic projection” recited in claim 24. It is not clear what are considered to be “any clock signal” and “any index signal” in these claims. The specification teaches that *in order* to achieve the “independence” of the switcher with respect to the input rate of the image data, the switcher *has to be synchronized* with the processed 3D image data, which is identified in the specification as “Output Synchronization” method, (please see the specification [0143]). If this is the case it is therefore not clear how could the switcher be “independent of any clock signal internal to the 3D stereoscopic projection system” or “any index signal

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internal to the 3D stereoscopic projection system”, since some kind of clock or index signal within projection system, (i.e. internal to the projection system), must be there to ensure and control the synchronization. Therefore it is not clear **what** are then *these signals* and how are they related to the achieving of “Output Synchronization”?

The phrase “synchronized to a color wheel index signal for convenience” recited in claim 25 is confusing and indefinite since there is **no “color wheel”** being defined or claimed in the system.

The phrase “said coupler” recited in claim 27 is confusing and indefinite since it lacks proper antecedent basis from it based claim.

The phrase “means for optically encoding a sequence of left-right images” recited in claim 29 is confusing and indefinite since it is not clear what is considered to be the “optical encoding”.

Claim 30 is *completely confusing* since it is not clear what is the relationships between steps (a), (b) and (c). The scope of the claim is therefore unclear and indefinite. The applicant is respectfully reminded to *positively* state the relationships between the various “image” recited in the claim (30) and its based claims to make the scopes definite.

The phrase “said spatially multiplexed stereoscopic image data” recited in claims 32 and 33 is confusing and indefinite since it lacks proper antecedent basis from their respective based claim.

*The claims as stand now contain numerous errors, confusions and indefiniteness. It is applicant’s responsibility to clarify ALL of the discrepancies in the claims to make them in comply with the requirements of 35 USC 112, first and second paragraphs.*

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 22-24, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sato et al (PN. 5,585,960).**

Sato et al teach an apparatus to display *stereoscopic image*, which serves as the 3D stereoscopic projection system, wherein a *digital micro-mirror image display device* (DMD, 12, Figures 3 and 4) is used to display left and right eye perspective images in a flicker free fashion, an implicitly requirement for creating stereoscopic illusion, in a *time sequential and spatial sequential manner*, (please see Figure 24). Sato et al teaches that the apparatus or the 3D projection system comprises a mirror driving circuit and mirror wiring section for generating and supplying mirror control signals to *drive* the mirror sections of the DMD display device. The apparatus further comprises a *control section* for forming the data signal, mirror control signals and the control signals for the light source sections to enable the stereoscopic image projection. Sato et al teaches that the switching of the micro mirrors to display left and right perspective image is *synchronized* with respect to the *visual point regions*, that is to say the mirror control signals are determined by the *visual point region sync signal* E0, (please see column 11, lines 30-35). It is implicitly true that the visual point region signals are *position information* bearing *sync signals* related to the *processed* 3D left eye and right eye perspective image data that are *formed by input signals*, (please note the forming of the image data for projection by the control section). It is implicitly true that the stereoscopic image projection is based on the *synchronization* between the *visual point region information* and *switching* of the digital micro-mirror image display device, which means that the rate at which image data received by the 3D projection system is *irrelevant* to the projection of the 3D image data. It is therefore either implicitly true that the switching of the DMD display device is *independent* of the rate of the image data being received, since the signal data is inputted and then *formed* by the *control section* into the image data signal to be displayed with *visual point region sync signals* as control or an obvious modification to one skilled in the art for the benefit of forming of the image data as

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taught by Sato et al to not rely on the input rate to reduce the projection image degradation caused by discontinuity of the input signal rate.

With regard to claim 23 and 24, Sato et al does not teach explicitly that the switching of the DMD display is independent of any clock signal or index signal internal to the projection apparatus. However this really **cannot** be the case, since in order for the stereoscopic image to be projected by the system certain kind of synchronization between the switching of the DMD display and the supplying of the image data has to be provided, even the specification of the instant application teaches about the Output Synchronization needed to be provided in order for the apparatus to be operable. It is therefore implicitly true the synchronization must be controlled by some kind of clock signal or index signal internal to the projection system and the switching of the DMD display cannot be independent of any clock signal and index signal.

With regard to claims 26-29, Sato et al teach that the left and right perspective images are in time and spatial sequential or multiplexed fashion since the left eye and right eye perspective images are produced at different time sequence and at different spatial location. The image is also in column-multiplexed format, (please see Figure 24). Sato et al teaches that a *control section* is used to form the image data, or the left eye and right eye perspective image in the multiplexing manner. Also the synchronization between the switching of the DMD mirror and the visual point information of the multiplexed image data is controlled by the control section, which then in a way serves as the decoupler for decoupling the input image data rate and the switching of the right and left eye perspective images.

**7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sato et al as applied to claim 22 above, and further in view of the patent issued to Gove et al (PN. 5,528,317).**

The apparatus for projecting stereoscopic image taught by Sato et al as described for claim 22 above has met all the limitations of the claim. This reference however does not teach explicitly that the switching of the left and right perspective image is in synchronization with a color wheel signal. Gove et al in the same field of endeavor teaches a method and apparatus of synchronizing the display timing of a digital micro mirror display system with a color wheel, (please see column 5 and Figures 1-5), such that the display timing becomes independent of the timing of the input video timing. It would then have been obvious to one skilled in the art to apply the explicit teachings of Gove et al to modify the projection system of Sato et al for the benefit of minimizing the discontinuity in input video signal timing on the display.

8. **Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al as applied to claim 22 above, and further in view of the patent issued to Lazzaro et al (PN.6, 456,432).**

The apparatus for projecting stereoscopic image taught by Sato et al as described for claim 22 above has met all the limitations of the claims. Sato et al teach that the left and right perspective image is displayed in column-multiplexed format and in time sequential manner however it does not teach explicitly about the *data conversion methods* as claimed in the claims. *Claim 30 is extremely confusing and it is not clear what kind of data conversion is really claimed.* It can only be examined in the broadest sense. Lazzaro et al in the same field of endeavor teaches a stereoscopic image viewing system wherein a data conversion method is used to display the time multiplexed image stream by converting the *spatially interlaced image data* into *time multiplexed image streams*, (please see column 11, and Figure 3). It would then have been obvious to one skilled in the art to apply the teachings of Lazzaro et al to actually carry out the conversion of data into desired time multiplexed format for displaying it.



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9. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sato et al as applied to claim 22 above, and further in view of the patent issued to Lazzaro et al and Martinez et al (PN. 5,226,114).

The apparatus for projecting stereoscopic image taught by Sato et al as described for claim 22 above has met all the limitations of the claims. This reference however does not teach explicitly that a column blanking method and column doubling method is used in the claimed conversion method. Lazzaro et al in the same field of endeavor teaches a stereoscopic image viewing system wherein a data conversion method is used to display the time multiplexed image stream by converting the spatially interlaced image data into time multiplexed image streams, (please see column 11, and Figure 3). It would then have been obvious to one skilled in the art to apply the teachings of Lazzaro et al to actually carry out the conversion of data to desired time multiplexed format for displaying it. These references however do not teach about the column blanking or column doubling method. Martinez et al in the same field of endeavor teaches that it is well known in the art to use *column-doubling method* in displaying the image to improve image resolution, (please see column 1). It would then have been obvious to one skilled in the art to modify the display apparatus for the benefit of improving the image resolution. Similarly, it would have been obvious to one skilled in the art to modify the display apparatus of Sato et al to use column-blanking method to improve the resolution and quality of image display for such method is also well known in the art.

#### ***Response to Arguments***

10. Applicant's arguments with respect to claims 22-33 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

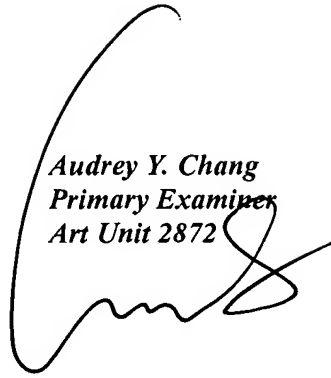
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*Audrey Y. Chang*  
*Primary Examiner*  
*Art Unit 2872*

A. Chang, Ph.D.

A handwritten signature in black ink, appearing to be 'Audrey Y. Chang', written over the printed name and title.